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## Comparative study on cardiovascular fitness among school children of Uttrakhand

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### Abstract

The objective of the study was to compare cardiovascular fitness among school children of Uttrakhand. The subjects for this study were from the state of Uttrakhand. The simple random sampling was used in the study. A total number of Two Thousand (2000) subjects were selected from the Rural and Urban part of Uttrakhand. Moreover, subjects were also selected from different schools (Private and Government) of Uttrakhand. The all subjects were between age group of 13-17 years. To check the cardiovascular fitness of subjects Cooper 12 Min Run/Walk test was used by the researcher. After the collection of relevant data; to investigate the significance difference between cardiovascular fitness among school children of Uttrakhand, Analysis of variance (ANOVA) was applied. The level of significance was set at 0.05 percent ( $p < 0.05$ ). After the analysis the results shows that the Government Rural School boys had better cardiovascular fitness as compare to the Private Rural School boys. The result shows that the Government Rural School boys had better cardiovascular fitness as compare to the Government Urban School boys. Further the results shows that the Government Rural School boys had better cardiovascular fitness as compare to the Private Urban School boys.

**Keywords:** School children, cardiovascular fitness, urban school, rural school

### Introduction

Each day, virtually all people participate in some type of physical activity. Common to all activities is the involvement of the cardiovascular system. The cardiovascular responses that take place can be brief and “relatively” minor, such as an increase in heart rate as one stand up from a chair and walks from one room to another. (Foss & Keteyien, 1998) <sup>[4]</sup>. The respiratory system supplies oxygen to the body carries off carbon dioxide a waste product of body processes and helps regulate acid produced during metabolism. As air is inhaled, it passes through the nasal passages, the throat, larynx, trachea (windpipe), and bronchi into the lungs. The lungs consist of many branching tubes that end in tiny, thin-walled air sacs called alveoli. Carbon dioxide and oxygen are exchanged between alveoli and capillaries in the lungs. Oxygen from inhaled air is passed from the alveoli into blood cells; these oxygen rich blood cells then return to the heart and are pumped throughout the body (Fahey *et al.* 2005) <sup>[3]</sup>. Cardiovascular Endurance is the ability to continue training the cardiovascular system for a period longer than twenty minutes on average. During the scanning of relevant literature for the proposed topic, no study was found revealing the difference between cardiovascular fitness among school children of Uttrakhand. The scholar, being ardent lover of physical fitness and experienced the great benefits of cardiovascular fitness. Hence, in the present study it was planned to scrutinize the difference between cardiovascular fitness among school children of Uttrakhand. Paludo *et al.* (2012) <sup>[8]</sup> analyzed cardio-respiratory fitness (CRF) in adolescents aged 10 to 12 years by means of the 9-minute run/walk test. Findings suggest that the 9-minute test appears to be a valid indicator of cardio-respiratory fitness (CRF) in adolescents between the ages of 10 and 12.

### Materials and Methods

In the present study it was planned to scrutinize the difference between cardiovascular fitness among school children of Uttrakhand. The subjects for this study were from the state of Uttrakhand. The simple random sampling was used in the study.

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A total number of Two Thousand (2000) subjects were selected from the Rural and Urban part of Uttarakhand. Moreover, subjects were also selected from different schools (Private and Government) of Uttarakhand. The all subjects were between age group of 13-17 years. To check the cardiovascular fitness of subjects Cooper 12 Min Run/Walk test was used by the researcher. After the collection of relevant data; to investigate the significance difference between cardiovascular fitness among school children of Uttarakhand, Analysis of variance (ANOVA) was applied. The level of significance was set at 0.05 percent ( $p < 0.05$ ).

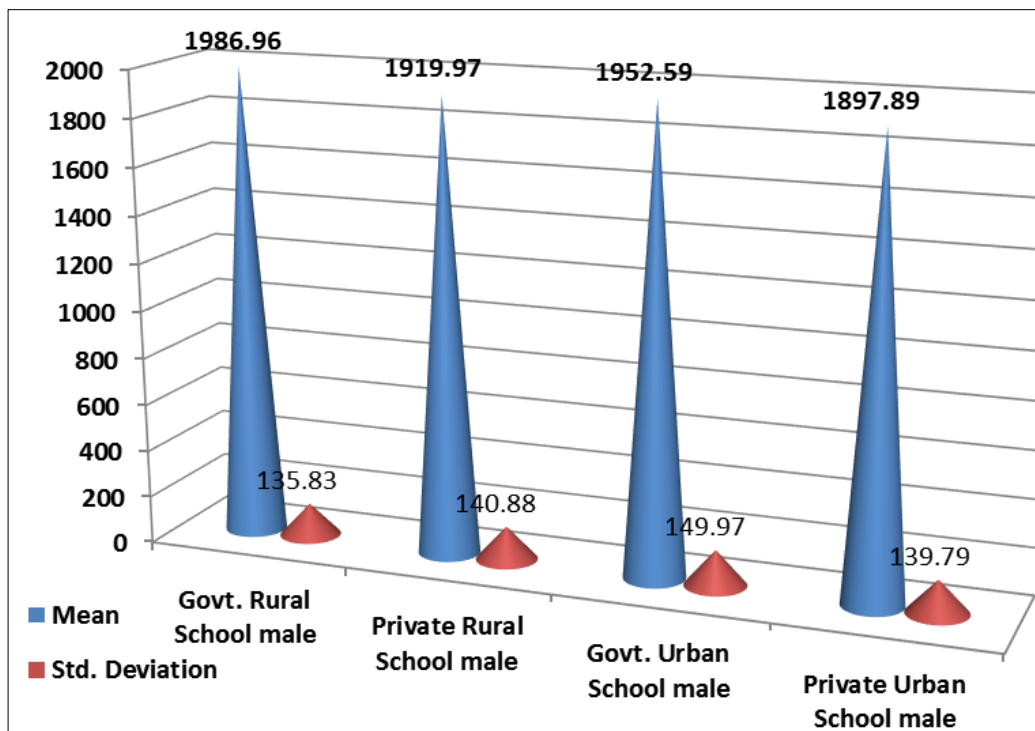
**Results and Discussion**

Descriptive Analysis of Cardiovascular Fitness among four different types of School boys has been presented in table-1.

**Table 1:** Mean and Standard Deviation Results With Regard to Cardiovascular Fitness among Four Different Types of School Boys

Group	N	Mean	STD. Deviation
Government Rural School boys	500	1986.96	135.83
Private Rural School boys	500	1919.97	140.88
Government Urban School boys	500	1952.59	149.97
Private Urban School boys	500	1897.89	139.79
Total	2000	1939.35	145.56

Table-1 shows the Mean and SD values of Government Rural School boys for their cardiovascular fitness of different types of school (Government Rural, Private Rural, Government Urban and Private Urban School) boys were  $1986.96 \pm 135.83$ ,  $1919.97 \pm 140.88$ ,  $1952.59 \pm 149.97$  and  $1897.89 \pm 139.79$  respectively. The graphical representation of responses has been exhibited in figure 1.



**Fig 1:** Mean and SD With Regards To Cardiovascular Fitness among Four Different Types of School Boys

The Analysis of Variance (ANOVA) for four different types of School boys on Cardiovascular Fitness among is presented in Table-2.

**Table 2:** Analysis of Variance (ANOVA) Results With Regard to Cardiovascular Fitness among Four Different Types of School Boys

	Sum of Squares	Df	Mean Squares	F	Sig.
Between groups	2268171.132	3	756057.044	37.646*	.000
Within groups	40086760.540	1996	20083.547		
Total	42354931.672	2000			

\*Significant at .05 level  
 $F_{.05}(3, 1996) = 2.61$

It is evident from table-2 that the results of Analysis of Variance (ANOVA) among four different types of school boys with regard to the cardiovascular fitness were found to be statistically significant ( $P < 0.05$ ). Since the obtained "F" ratio 37.646 (.000) was found statistically significant. Further, LSD Post Hoc test of significant was applied to find out the actual significant difference on cardiovascular fitness among different types school boys. The results of Post Hoc test of significance have been presented in table-3.

**Table 3:** Analysis of Least Significant Difference (LSD) Post Hoc Test With Regard to Cardiovascular Fitness among Four Different Types of School Boys

(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Sig.
Government Rural School boys Mean=1986.96	Private Rural School boys	66.98800*	.000
	Government Urban School boys	34.37400*	.000
	Private Urban School boys	89.07000*	.000
Private Rural School boys Mean=1919.97	Government Rural School boys	-66.98800*	.000
	Government Urban School boys	-32.61400*	.000
	Private Urban School boys	22.08200*	.014
Government Urban School boys Mean=1952.59	Government Rural School boys	-34.37400*	.000
	Private Rural School boys	32.61400*	.000
	Private Urban School boys	54.69600*	.000
Private Urban School boys Mean=1897.89	Government Rural School boys	-89.07000*	.000
	Private Rural School boys	-22.08200*	.014
	Government Urban School boys	-54.69600*	.000

A glance at Table-3 showed that the mean value of Government Rural School boys were 1986.96 whereas Private Rural School boys had mean value as 1919.97 and the mean difference between both the groups was found 66.98800\*. The p-value sig.000 shows that the Government Rural School boys subjects had demonstrated better on cardiovascular fitness as compare the Private Rural School boys significantly. The mean value of Government Rural School boys were 1986.96 whereas Government Urban School boys had mean value as 1952.59 and the mean difference between both the groups was found 34.37400\*. The p-value sig.000 shows that the Government Rural School boys subjects had demonstrated better on cardiovascular fitness as compare the Government Urban School boys significantly. The mean value of Government Rural School boys were 1986.96 whereas Private Urban School boy shad mean value as 1897.89 and the mean difference between both the groups was found 89.07000\*. The p-value sig.000 shows that the Government Rural School boys subjects had demonstrated better on cardiovascular fitness as compare the Private Urban School boys significantly. The mean difference cardiovascular fitness between Private Rural School boys and Government Urban School boys was found -32.61400\*. The p-value sig.000 is significant difference. The mean difference cardiovascular fitness between Private Rural School boys and Private Urban School boys was found 22.08200\*. The p-value sig.014 is significant difference. The mean difference of cardiovascular fitness between Government Urban School boys and Private Urban School boys was found 54.69600\*. The p-value sig.000 is significantly difference.

### Conclusion

After the analysis the results shows that the Government Rural School boys had better cardiovascular fitness as compare to the Private Rural School boys. The result shows that the Government Rural School boys had better cardiovascular fitness as compare to the Government Urban School boys. Further the results shows that the Government Rural School boys had better cardiovascular fitness as compare to the Private Urban School boys.

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